

2010 NETL CO₂ Capture Technology Meeting Sheraton Station Square, Pittsburgh, PA



September 13-17, 2010

The U.S. Department of Energy's Pre-Combustion CO₂ Capture R&D Program

http://www.netl.doe.gov/publications/index.html

NETL

NATIONAL ENERGY TECHNOLOGY LABORATORY

2010 NETL CO₂ Capture Technology Meeting

Sept. 13 – Sept. 17, 2010 Pittsburgh, PA

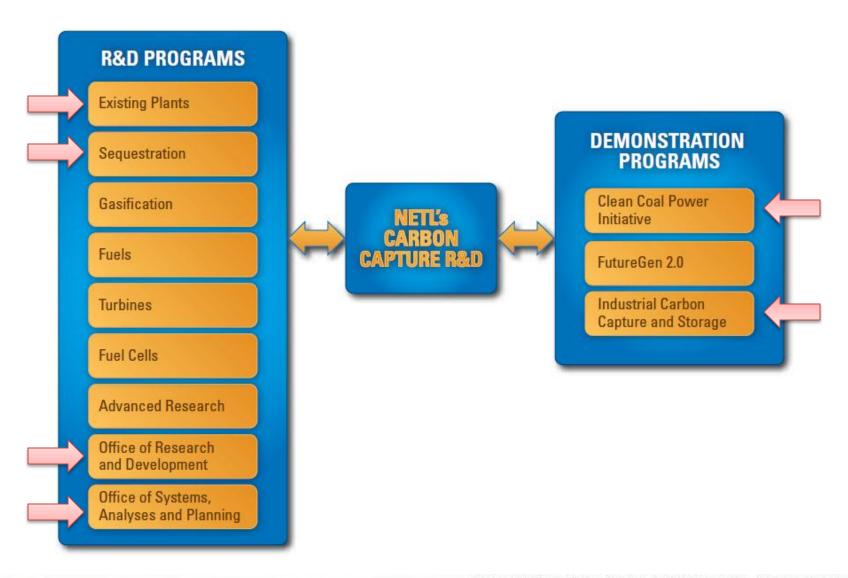


The U.S. Department of Energy's Pre-Combustion CO² Capture R&D Program

Sean Plasynski, Technology Manager John Litynski, Division Director Sequestration Program



DOE/NETL CO₂ Capture RD&D Program



U.S. DEPARTMENT OF ENERGY • OFFICE OF FOSSIL ENERGY NATIONAL ENERGY TECHNOLOGY LABORATORY

CARBON SEQUESTRATION PROGRAM with ARRA Projects

Core R&D Pre-combustion Capture Geologic Storage Monitoring, Verification, and Accounting (MVA) Simulation and Risk Assessment CO₂ Use/Reuse

ARRA: University Projects

Lessons
Learned

Benefits

- · Reduced cost of CCS
- Tool development for risk assessment and mitigation
- Accuracy/monitoring quantified
- CO₂ capacity validation
- Indirect CO₂ storage

Infrastructure

Regional Carbon Sequestration Partnerships

Characterization

Validation

Development

ARRA: Development of Technology Transfer Centers

ARRA: Site Characterization

Other Large-Scale Projects

Benefits

Technology

Solutions

- · Human capital
- · Stakeholder networking
- Regulatory policy development
- · Visualization knowledge center
- · Best practices development
- · Public outreach and education

Global Collaborations

North America Energy Working Group

Carbon Sequestration Leadership Forum

International Demonstration Projects

Canada (Weyburn, Zama, Ft. Nelson) Norway (Sleipner and Snovhit) Germany (CO2Sink)

Australia (Otway) Africa (In-Salah) Asia (Ordos Basin)

Benefits

Technology

Lessons

Learned

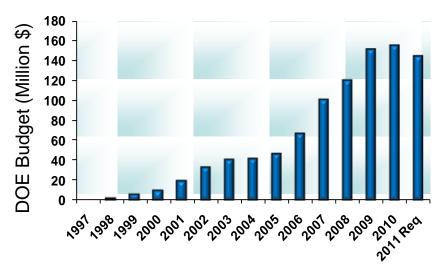
Solutions

- · Knowledge building
- · Project development
- Collaborative international knowledge
- Capacity/model validation
- · CCS commercial deployment

Demonstration and Commercialization Carbon Capture and Storage (CCS)

Sequestration Program Total Funding

Program Statistics 2010 (no ARRA funding included)



Fiscal Year

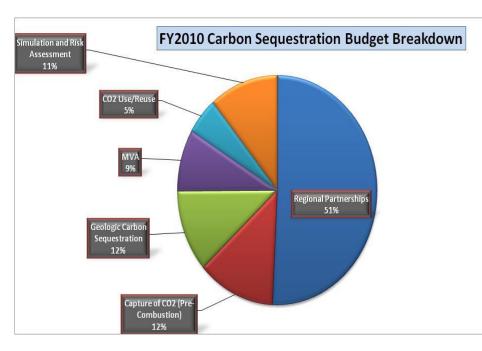
Diverse research portfolio

~ 80 Active R&D Projects

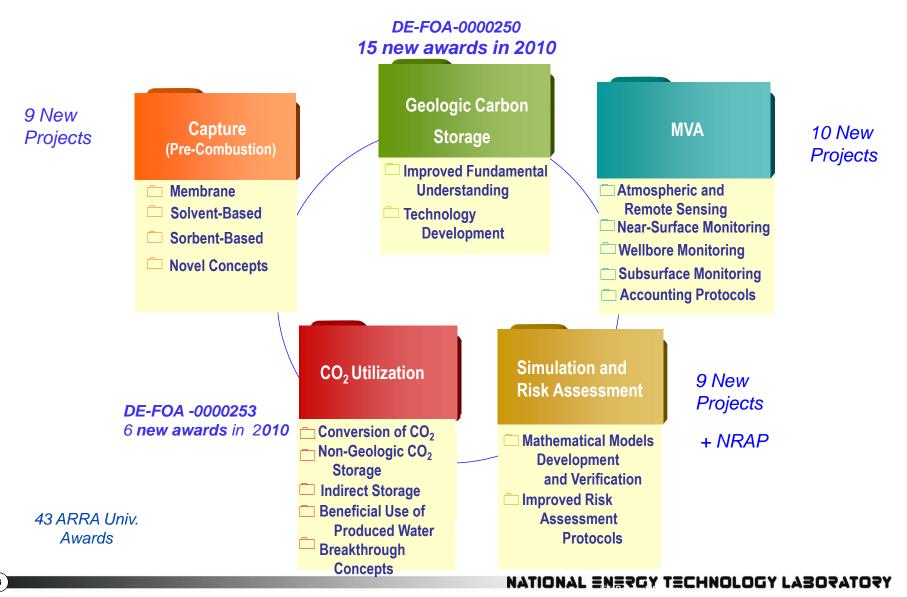
+21 new starts in FY10

+ 60 ARRA Projects

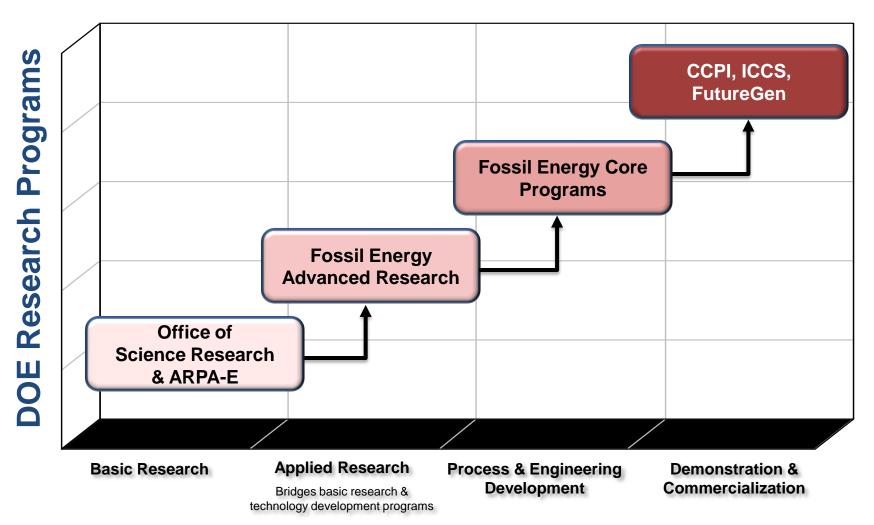
Strong industry support ~ 39% cost share on projects



Building of Core R&D Portfolio Core R&D Focus Areas

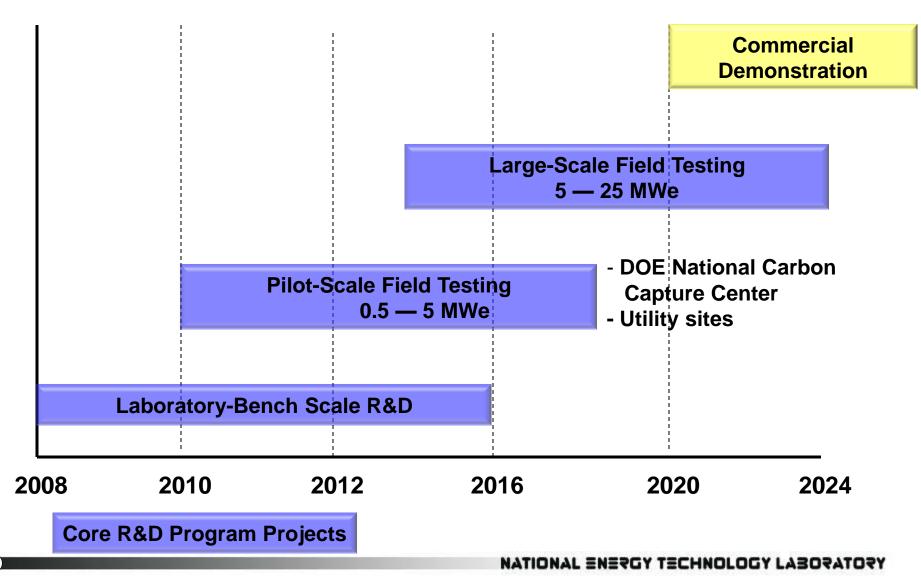


Stages of Energy RD&D



Research Phases

Advanced CO₂ Technology Timeline

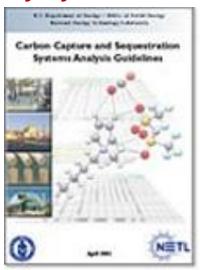


Pre-Combustion CO₂ Capture Goals

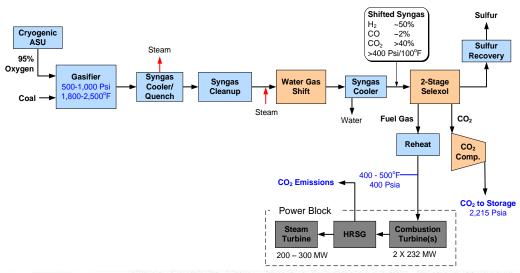
By 2020, have available for <u>demonstration</u>, advanced CO_2 capture technologies that achieve: $90\% CO_2$ capture

< 10% increase in COE²

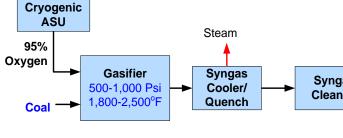
Set by Systems Analyses



Evaluated by Systems Analyses



IGCC Pre-combustion CO₂ Capture Technologies



9 new projects awarded in 2009 High Temperature H₂/CO₂ Membranes

- Univ. of Minnesota (Zeolite based)
- Pall Corporation (Pd alloy based)
- Arizona St. Univ. (Ceramic-carbonate)

High-efficiency solvents

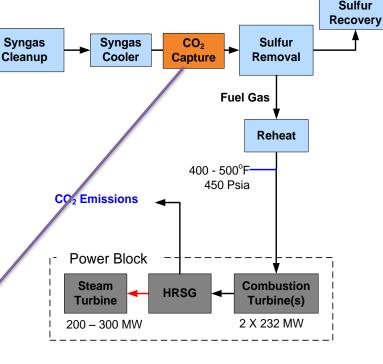
SRI International (AC/ABC)

Solid Sorbents

- TDA Research
- URS Group

Novel Concepts

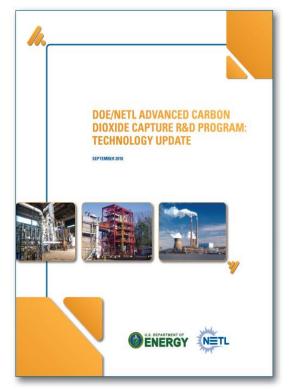
- Gas Tech, Institute
- Membrane Technology
- New Jersey Institute of Technology



Sulfur

DOE/NETL Advanced CO₂ Capture R&D Program: Technology Update (September 2010)

- Just published and available for download
- This comprehensive handbook provides an update on DOE/NETL R&D efforts on advanced CO₂ capture technologies for coal-based power systems.
- Prepared by the Existing Plants and Sequestration R&D Programs, the report tracks the progress of DOE/NETL pre-combustion, post-combustion, and oxy-combustion technologies for CO₂ capture.
- The handbook is available for download on the NETL website at these two locations:



http://www.netl.doe.gov/technologies/coalpower/ewr/index.html

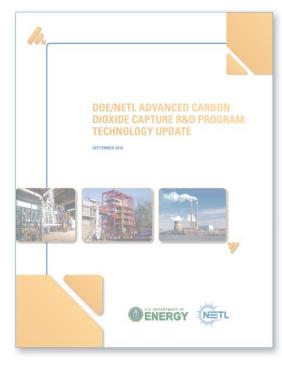
http://www.netl.doe.gov/technologies/carbon_seq/index.html

DOE/NETL Advanced CO₂ Capture R&D Program: Technology Update (September 2010)

Special request to our Project Principal Investigators:

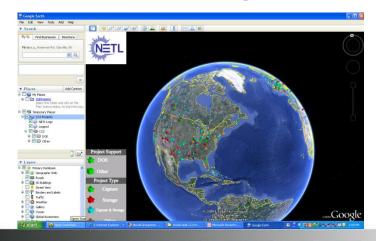
We need your help in updating and improving the format and content of this handbook for next year's publication.

- For questions or comments regarding the handbook, please contact:
 - Jared P. Ciferno, Technology Manager, Existing Plants R&D Program (post-combustion and oxycombustion technologies) jared.ciferno@netl.doe.gov
 - Sean I. Plasynski, Technology Manager, Sequestration R&D Program (pre-combustion technologies) sean.plasynski@netl.doe.gov



World-Wide CCS Projects Database

- Data compiled from a multitude of sources
 - Websites, factsheets, reports, news postings, etc...
- To date, ~195 projects projects
 - Includes active, developing, proposed, on hold, or completed)
 - USA: ~ 80 projects
 - International: ~ 115 projects
- Approximately 125 projects active
 - Either capturing, injecting, developing infrastructure, site characterization/selection, designing, or in the permitting process.
 - USA Projects: ~ 50 projects
 - International Projects: ~ 75 projects
- http://www.netl.doe.gov/technologies/carbon_seq/database/index.html





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